

III. REMARKS

Status of the Claims

Claims 1-25 are canceled. New claims 26-53 are added. Claims 26-53 are presented for further consideration.

Summary of the Office Action

The Examiner has objected to the drawing for failing to show the feature of the claims identified as "interconnecting element". Applicant submits that this feature is clearly shown and described in the figures and specification. At page 4, lines 9-14 and embodiment of the invention is described as:

"In one embodiment of the invention the sensor comprises at least one inertial mass with at least one tiny breakable cantilever such as a bracket, beam, or bar one end of which is connected to the inertial mass and the other end to a supporting frame. The size of the cantilever is quite small in comparison with the inertial mass. When the sensor is accelerated the inertial mass causes stress on the cantilever resulting in its rupture at a certain stress level"

The cantilever is shown by reference numeral 201 in figure 2, 301 in figure 3, and by other reference numerals throughout the specification. In the above excerpt, the cantilever is described as connecting the inertial mass to a supporting frame, there for it is an "interconnecting element". Applicant submits that the application fully complies with the requirements of 37CFR1.83(a) and requests that the drawing objection be withdrawn.

Applicant has submitted a new set of claims amended in view of the Examiner's objections and the rejection based on 35USC112. It is submitted that the new claims fully overcome the objections and rejection.

Original claims 1-3,7-10,13,15,17,18, and 24 of this application stand rejected under 35USC102 based on the cited reference, Seidel, et al, U.S. Patent Number 6,122,965. Original Claims 5 and 6 of this application stand rejected under 35USC103(a), based on the reference Seidel in view of Shinji(JP62036561). Original claims 4,11, and 12 stand rejected under 35USC103(a) based on Seidel in view of the reference Bashir, et al, US Patent No. 5,747,543.

Original claims 14 and 10-21 stand rejected under 35USC103(a) based on Seidel in view of the reference Tennes, et al, U.S. Patent No. 4,745,564. Claims 16,22, and 23 stand rejected under 35USC103(a) based on the reference Seidel in view of the cited reference Heikkinen, EP1 109 378 A2.

Discussion of the Cited Reference

The Examiner relies on the reference Seidel to support the rejection based on anticipation and as primary support for the rejection based on obviousness. Although applicant submits that the new claims submitted herewith emphasize the distinguishing features of this invention and thereby render the Examiner's rejections moot, it is constructive to discuss the previously cited references.

The Examiner has characterized the disclosure of Seidel, at least in part, as follows:

"a second body portion(#3a), an interconnecting element(#4a) making the first body portion integral with the second body portion and detecting means(#7) arranged for giving an indication when the second body portion damages the detecting means (column 2, line 50 to column 4, line 25 wherein the deformation of #4a due to the movement of #3a is read as damaging the detecting means)."

The system described in the reference Seidel is for measuring accelerations in three axes. The sensors used in Seidel consist of several bending beams 4a-4d that cooperate with piezoresistors 7 to sense bending of the beams in response to acceleration. The piezoresistors change their resistance as they are deformed in the

bending process. The claims of this application clearly recite that a component of the sensor is breakable and generates an indication on being ruptured. The piezoresistors are intended to be deformed as part of their normal operation and it is this feature for which such components were chosen for use in the system of Seidel. The piezoresistors of Seidel are not broken, ruptured, or damaged, but merely respond to the bending of the beam with a change in resistance. They return to their original shape and function for further detection of acceleration. The Examiner's reading of the deformation of the piezoresistors of Seidel, as breaking or rupturing in the subject application, is not supported by the cited reference.

The Issue of Anticipation

The anticipation analysis requires a positive answer to the question of whether the system of Seidel would infringe the claims of this application, if it were later.

New claims 26-41 of this application have the following feature:

"wherein each acceleration sensor comprises a first body portion, a second body portion, an interconnecting element making the first body portion integral with the second body portion and a detector arranged for giving an indication when a breakable component of the sensor is ruptured;

Since the above feature is not present in the system of the reference Seidel, there can be no infringement of the subject claims. Therefore the teaching of Seidel does not support the rejection based on anticipation with respect to these claims.

The Issue of Obviousness

The Examiner has also cited Shinji in conjunction with the teaching of Seidel in support of a the rejections based on obviousness.

Compared to Seidel, the acceleration sensor of the present invention is much simpler and cheaper to manufacture because it does not require piezoresistors or other complex detection means. Instead, breakage of a component of the device is used to detect an acceleration above a particular predetermined value. Because the device of the present invention aims only to detect whether an acceleration above a particular threshold value has occurred, it does not require continuous monitoring of accelerations and the more complicated components which are necessary for this, as used in Seidel. See in particular pages 2 to 4 of the present application.

Shinji discloses an acceleration detector comprising a number of mass parts 2, 4 and 6 attached to beams 3, 5 and 7 of varying length. The length of the beam member seems to determine the size of an acceleration required for deforming the beam as a means to measure acceleration.

The system of this application, as described in the claims, differ from Shinji in that Shinji does not disclose the features of two sensors being oriented differently such that they are more sensitive to forces in different directions.

Shinji uses masses attached to variable length beams in order to detect size of an applied acceleration. In contrast, the present invention is not so much concerned with accurately measuring the size of an acceleration per se, but rather with determining whether an acceleration in any direction is above a particular threshold value. Thus, the sensors of the present invention are oriented differently from one another whereas those of Shinji are all oriented in the same way.

Thus, the present invention is concerned with detecting above-threshold accelerations in any direction by the rupture of a breakable component. Neither of Shinji nor Seidel is concerned with such a problem. In particular there would have been no motivation to a skilled person to combine the disclosures of the two prior art documents. There is

no hint or suggestion in either document that there is a need for a low cost acceleration sensor which is capable of detecting threshold accelerations in different directions.

It is well settled that in order to establish a prima facie case for obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, without reference to the disclosure of this application.

Applicant submits that the above described deficiencies of the primary reference Siedel are not remedied by the proposed combination with the teaching of the reference Shinji. The combined references do not therefore support a prima-facie case of obviousness. The modification of the teachings of Seidel or Shinji, in order to obtain the invention, as described in the claims submitted herein, would not have been obvious to one skilled in the art.

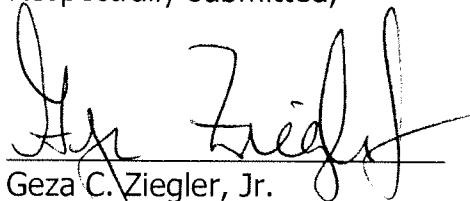
The Examiner has also cited the reference Bashir et al, Tennes and Heikennen with respect to specific dependent claims, but none of these additional references remedy the deficiencies of the primary reference Siedel. Their modification in order to obtain the subject invention, therefore, would not have been obvious to one skilled in the art.

The above arguments apply equally to the rejected dependent claims.

For all of the above reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

The Commissioner is hereby authorized to charge payment for two additional dependent claims (\$100) as well as any other fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,



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